

202970-2827607

What I Claim Is:

1. In a personal portable phone having an ear piece, the antenna improvement comprising:

5                   a first directional antenna positioned longitudinally displaced from the ear piece, said first directional antenna providing a predetermined conical electromagnetic energy radiation pattern, said conical pattern being positioned so that when a user places the ear piece  
10                  against the user's ear, said conical pattern will substantially miss the head of the user.

2. The improvement of claim 1 wherein said first directional antenna is a patch type antenna.

3. The improvement of claim 2 further comprising:  
5                   an antenna base mounted to slide along said ear piece from a retracted position to a protracted position,  
                      said first directional antenna being mounted on said antenna base,  
                      when the phone is in state to be used, said antenna base is in a protracted position to provide ready user access to the ear piece and said directional antenna is longitudinally displaced from said ear piece.

4. The improvement of claim 3 wherein said patch type antenna has an inoperative position flush with the face of said base when said base is in said retracted position and has  
5                  an operative position perpendicular to said base when said base is in said protracted position.

5. The improvement of claim 1 wherein the axis of said cone is parallel to the plane of the ear piece.

6. The improvement of claim 1 wherein said cone is a circular cone having an included angle of about 30° to 60°.

7. The antenna improvement of claim 1 further comprising:

a second directional antenna adjacent to said first antenna on said antenna base, said second antenna providing a predetermined conical electromagnetic energy radiation pattern propagating in a direction substantially 180° from the direction in which said conical electromagnetic radiation pattern propagates from said first antenna.

8. The improvement of claim 7 further comprising:

an antenna base mounted to slide along said ear piece from a retracted position to a protracted position, said first and second directional antenna being mounted on said antenna base, when the phone is in a state to be used, said antenna base is in a protracted position to provide ready user access to the ear piece and said first and second antennas are longitudinally displaced from said ear piece.

9. The improvement of claim 8 wherein said antennas have an inoperative position flush with the face of said base when said base is in said retracted position and have an operative position perpendicular to said base when said base is said protracted position.

10. The improvement of claim 9 wherein when said first and second antennas are in said operative position, they are substantially co-planar and wherein said plane of said antennas is perpendicular to the plane of said base.

11. The improvement of claim 7 wherein the axes of said cones are parallel to the plane of said ear piece.

12. The improvement of claim 11 wherein said cones are circular cones each having an included angle of about 30° to 60°.

13. In a personal portable phone having an ear piece, the antenna improvement comprising:

first and second patch type directional antennas positioned longitudinally displaced from the ear piece and  
5 longitudinally displaced from each other,

each of said directional antennas providing a predetermined conical electromagnetic energy radiation pattern propagating in substantially opposite directions,

10 said conical patterns having axes parallel to the plane of the ear piece and positioned so that, when a user places the ear piece against the user's ear, said conical patterns will substantially miss the head of the user.

14. In a personal portable phone having an ear piece, the antenna improvement comprising:

first and second patch type directional antennas positioned longitudinally displaced from the ear piece and  
5 longitudinally displaced from each other,

each of said directional antennas providing a predetermined conical electromagnetic energy radiation pattern propagating in substantially opposite directions,

10 said conical patterns having axes parallel to the plane of the ear piece, having an included angle of about 30° and positioned so that, when a user places the ear piece against the user's ear, said conical patterns will substantially miss the head of the user.

15. In a personal portable phone having an ear piece, the method of minimizing the impact of electromagnetic energy on the person of the user comprising the steps of:

5 providing a first directional antenna longitudinally displaced from the ear piece,

transmitting electromagnetic energy from said first directional antenna in a first predetermined conical pattern having a first axis,

10 positioning said conical pattern so that when the user places the ear piece against the user's ear, said first conical pattern will substantially miss the head of the user.

16. The method of claim 15 further comprising:

5 providing a second directional antenna positioned adjacent to said first antenna and also longitudinally displaced from the ear piece,

transmitting electromagnetic energy from said antenna in a second predetermined conical pattern having a second axis that is substantially parallel to said first axis of said first antenna,

10 said second conical pattern being positioned so that when a user places the ear piece against the user's ear, said second conical pattern will substantially miss the head of the user.

17. The method of claim 16 wherein said steps of transmitting energy from said first and second antennas are in directions substantially  $180^\circ$  opposed to one another.

18. The method of claim 16 wherein said first and second conical patterns each have an included angle of about  $30^\circ$ .